US Army Medical Research and Materiel

Technology Available for Licensing

Flavivirus Detection and Quantification Assay

This invention relates to a nucleic acid-based diagnostic system for rapid and specific flavivirus identification and quantification which involves a novel set of oligonucleotides. The invention could be used to prepare a reverse transcriptase-polymerase chain reaction (RT-PCR)-based diagnostic kit for the detection and differentiation of Japanese encephalitis, West Nile, hepatitis E, and dengue viruses.

The *Flaviviridae* family includes almost 70 viruses, some of which cause dengue fever, yellow fever, and various types of encephalitis. There are four distinct dengue virus serotypes that cause infection in humans. Infections are usually confirmed by serologic detection of dengue-specific antibodies and/or culture of the virus in insect cells or mosquito inoculation. These detection methods are very time-consuming, labor intensive, and have limited sensitivity for low levels of viruses. Current methods frequently have mismatches corresponding to their amplicons, or even to primer sequences, due to genetic differences among strains of the same dengue serotype. These mismatches result in reduced sensitivity of the current assays and false diagnosis of the specific dengue serotype. Recently, explosive growth in dengue virus transmission and an increased incidence of dengue hemorrhagic fever have occurred. Therefore, development of sensitive, serotype-specific dengue diagnostic systems is crucial.

s-specific upstream primers, probes, and downstream primers are provided in the invention. Individual virus-specific assay mixtures can be formulated to identify and quantify one virus at a time, as even single nucleotide substitutions can be reliably detected. The de and duration of viremia during flavivirus can be measured, making studies of viral clearance by different immunologic mechanisms easier.

Features and advantages:

- **Uses a fluorogenic RT-PCR assay**
- **Capable of detecting extremely low levels of dengue virus from clinical specimens**
- **Can identify dengue virus isolates from different geographic regions**
- **Could provide rapid, bedside diagnosis and confirmation of flavivirus infection**
- **Method could be developed as a quality assurance check for**

Patent Status

Patent No.: 6,793,488 **Available from:** www.uspto.gov **Issued:** September 21, 2004 **Docket No.:** WRAIR 99-09

Point of Contact

Dr. Paul C. Mele
Director, Office of Research and Technology Applications
USAMRMC, MCMR-ZA-J
504 Scott St., Ft. Detrick, MD 21702-5012
E-mail: usamrmc@amedd.army.mil
Voice: 301-619-6664/2065/7219 Fax: 301-619-5034

KEYWORDS: diagnostics; quantitative RT-PCR; serotype-specific; dengue virus; Japanese encephalitis; West Nile virus; hepatitis E virus; fluorogenic RT-PCR

Licensing Opportunities • Patent licenses are available to companies with commercial interests